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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/930,548	08/15/2001	Stephen Suryaputra	13767BAUS01U	9857

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EXAMINER	
GREY, CHRISTOPHER P	

ART UNIT	PAPER NUMBER
2667	

DATE MAILED: 11/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/930,548	SURYAPUTRA ET AL.	
	Examiner	Art Unit	
	Christopher P Grey	2667	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21, August, 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Responsive to the amendment filed on 31 August 2005, claims 1,18,27,30 and 32 have been entered as requested.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1- 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beardsley et al (US 6006342) in view of Lamport et al. (US 5138615)

Claim 1, 18 Beardsley et al. ('Beardsley' hereinafter) discloses a second processor, non volatile memory unit and cache that is a backup system to a first processor, non volatile memory and cache (Col 2 line59- Col3 line 6).

Beardsley discloses in the event of a failure affecting at least the first processor, non volatile memory or/and cache (primary end system), routing data to the second processor, non volatile memory and cache (back up end system) as disclosed in Col 2 line 59- Col 3 line 6.

Beardsley discloses the logic used to control failover and failback (Col 6 line 50- Col 7 line 40). However, Beardsley does not specifically disclose constructing a failover tree to the back up system. Lamport et al. ('Lamport' hereinafter) discloses in the event

of a failure in a primary path, recomputing the paths between hosts on a network Col 33 line 60- Col 34 line 3). Furthermore Lamport discloses spanning tree links used in the event of reconfiguration, which occurs when there is a failure (Col 38 line 34-48).

Therefore it would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the failover logic as disclosed by Beardsley, to include a spanning tree, ensuring that data is transmitted in a predictable and efficient fashion (Col 38 lines 34-48).

Claim 2, 19, 33 Beardsley discloses failover logic assisting in implementing a backup system as disclosed in the rejection of claims 1 and 18. Furthermore, Beardsley discloses in the event of a failure, sending a request to a second processor (Col 6 line 64- Col 7 line14).

Claim 3, 20, 34 Beardsley discloses the process of failover as disclosed in the rejection of claims 1 and 18, where failover is an automatic discovering method (inherent).

Claim 4, 21, 36 Beardsley does not disclose determining a root node for the failover tree, and constructing a failover tree at the root node.

Lamport discloses a designated root node, which is an integral part of the spanning tree (Col 6 lines 15-21).

Lamport also discloses the root node having special responsibilities during reconfiguration (Col 6 lines 15-21 and Col 39 lines 29-35), where reconfiguration (constructing) involves using the spanning tree in the event of a failure to reroute data flow (Col 38 lines34-48).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the failover logic as disclosed by Beardsley, to designate a root node within the spanning tree in order to assist in reconfiguration (Col 6 lines 15-21).

Claim 5, 37 Beardsley discloses completely switching from a first path to a second path as disclosed in the rejection of claims 1 and 18. Beardsley does not disclose identifying a candidate node within a predetermined distance; constructing a shortest path spanning tree from the candidate node to the back up system, and selecting the candidate node as the root node.

Lamport discloses each node within the spanning tree being a possible (candidate) root node (Col 39 lines 41-50).

Lamport discloses each switch (node) determining its position in the spanning tree (Col 39 lines 10-28). Lamport also discloses a preferred path being the shortest legal path (Col 9 lines 28-33 and Col 8 lines 64-67). Lamport discloses the process of reconfiguration as disclosed in the rejection of claims 4, 21 and 36, where it would have been obvious to one of the ordinary skill in the art at the time of the invention to implement the shortest path determined from analyzing the spanning tree from an alternate node to the end system.

Lamport discloses the switches agreeing (selecting) on the identity of the root node (Col 39 lines 10-50).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the failover logic as disclosed by Beardsley, to determine a root

node as disclosed by Lamport. The motivation for this modification is to implement a root node, which assists in reconfiguration (Col 6 lines 15-21).

Claim 6, 23 Beardsley does not disclose using a marking scheme to identify the candidate node. Lamport discloses using a node ranking (marking), where each switch is ranked based on how close it is to the root node (Col 3 lines 14-18).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the failover logic as disclosed by Beardsley, to use a ranking rule as disclosed by Lamport. The motivation for this modification is to monitor how close each node is, assisting in determining a shortest path on reconfiguration.

Claim 7, 24 Beardsley does not disclose solving a geometrical problem to identify the candidate node.

Lamport discloses ranking the nodes based on how close they are to the root node (Col 3 lines 14-18). Furthermore Lamport discloses determining a shortest path (Col 9 lines 20-33 and lines 15-20).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the failover logic to determine a shortest path, where in determining a shortest path, geometrics must be taken into consideration.

Claim 8, 25 Beardsley does not disclose constructing the shortest spanning tree from the candidate node to the back up end system based upon topology information.

Lamport discloses finding a shortest path (Col 9 lines 20-33 and lines 15-20), where this path is related to a spanning tree (Col 6 lines 4-12). Lamport also discloses

using the spanning tree to perform reconfiguration, where reconfiguration involves updating topology information (Col 34 lines 5-17 and Col 3 lines 35-44).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the failover logic as disclosed by Beardsley, to recomputed the paths within the spanning tree in order to update the changes in the topology of the network (Col 39 lines 10-27).

Claim 9, 26, 38, 39, 40 Beardsley discloses reserving a first data path in the event of a failure, and failing back to that path in the event of repair to that path (Col 3 lines 15-19)

Beardsley does not disclose sending a request message specifying a failover tree structure to various nodes in the optical communications network; and recording the failover tree structure by nodes associated with the failover tree.

Lamport discloses in the event of reconfiguration, which is triggered by a failure, a switch sending to all of its neighboring nodes a message (claim 26) indicating its reconfiguration (Col 39 lines 10-28).

New tree position messages are transmitted by a switch to its neighboring nodes. Lamport also discloses updating a topology in the even of reconfiguration that involves updating a position within the spanning tree Beardsley discloses in the event of a failure affecting at least the first processor, non volatile memory or/and cache (primary end system), routing data to the second processor, non volatile memory and cache (back up end system) as disclosed in Col 2 line 59- Col3 line 6.

Beardsley discloses the logic used to control failover and failback (Col 6 line 50- Col 7 line 40). However, Beardsley does not specifically disclose constructing a failover tree to the back up system. Lamport et al. ('Lamport' hereinafter) discloses in the event of a failure in a primary path, recomputing the paths between hosts on a network Col 33 line 60- Col 34 line 3). Furthermore Lamport discloses spanning tree links used in the event of reconfiguration, which occurs when there is a failure (Col 38 line 34-48).

Therefore it would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the failover logic as disclosed by Beardsley, to include a spanning tree, ensuring that data is transmitted in a predictable and efficient fashion (Col 38 lines 34-48).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the processors as disclosed by Beardsley, to store a change in topology /configuration in order to ensure that each node capable of communication acknowledges a change in the network.

Claim 10, 28, 42 Beardsley discloses the detection of a failure as disclosed in the rejection of claim 1 and 27. However, Beardsley does not specifically disclose monitoring a bearer channel between the primary end system and a corresponding edge node and querying the primary end system.

Lamport discloses monitoring links, and detecting the failure of any part of the network (Col 33 line 60 – Col 34 line 4).

Lamport discloses the reconfiguration program (optical service agent) continually monitoring (querying) the link units in a switch, and detecting any fault within the network.

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the detection of a failure as disclosed by Beardsley, with the monitoring mechanism as disclosed by Lamport in order to effectively and automatically detect and recover from a failure.

Claim 11 Beardsley discloses in the event of a failure affecting a first path, routing data via a second path, to the second processor, non volatile memory and cache (back up end system) as disclosed in Col 2 line 59- Col3 line 6.

Beardsley does not specifically disclose determining a failover node in the failover tree. However, Lamport discloses automatically activating a second link connected to an alternate node (Col 6 lines 35-46) governed by a spanning tree (Col 6 lines 5-12).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the failover logic as disclosed in the rejection of claim 1 and 18.

Claim 12, 43 Beardsley does not disclose propagating a release message upstream from a primary edge node associated with the primary end system toward a predetermined root node of the failover tree; receiving the release message by an intermediate node; and determining by the intermediate node that it supports a back up end system.

Lamport discloses sending DEAD signals throughout the network indicating an error (Col 36 lines 50-63). Dead signals indicate a need for reconfiguration.

Lamport also discloses a network member receiving a message informing it that a switch had some form of error (Col 36 lines 50-63).

In the reconfiguration process, each node updates its topology and determines its tree position (Col 39 lines 10-28). Updating of the topology is helpful in switching from a first path to a second path (Col 6 lines 35-46).

It would have been obvious tone of the ordinary skill in the art at the time of the invention to modify the failover logic as disclosed by Beardsley, to indicate an error, need for switching, and updating the topology. The motivation for this modification is to effectively handle errors and updates.

Claim 13, 31, 45, 46 Beardsley discloses reserving a second data path in the event of a failure, (Col 2 line 59-Col 3 line 5).

Beardsley does not disclose sending a lightpath setup request by the failover node downstream toward the backup lightpath.

Lamport discloses in the event of reconfiguration, which is triggered by a failure, a switch sending to all of its neighboring nodes a message indicating its reconfiguration (Col 39 lines 10-28).

Therefore it would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the failover logic disclosed by Beardsley to indicate via a message or request that a failure has occurred and that there is a need for switching over to a back up path. The motivation for this modification is to ensure that a backup

path is available and indicate to the backup end system that a failure has occurred and switching is necessary.

Claim 14, 44, 47 Beardsley discloses failover logic for routing data to a second path (back up path) as disclosed in Col 2 line 59-Col 3 line 5.

Beardsley does not disclose sending a connect message by a backup edge node associated with the back up end system to the failover node.

Lamport discloses an ALIVE message indicating that a network member is successfully receiving and sending signals over a link (Col 34 lines 56-65).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the failover logic as disclosed by Beardsley to indicate that a back up path has been established or is ready to be connected. The motivation for this is to acknowledge a back up path, thus effectively and automatically switching over to this path in the event of a failure.

Claim 15 Beardsley discloses a failover logic designed to reroute (relinquish) data from a first path including a first processor, non volatile memory or/and cache (primary end system) as disclosed in Col 2 line 59- Col3 line 6.

Claim 16, 17 Beardsley discloses failing back to the first path in the event that a failure has been repaired (Col 3 lines 15-20).

Claim 27 Beardsley discloses in the event of a failure affecting at least the first processor, non volatile memory or/and cache (primary end system), rerouting data (Col 2 line 59- Col3 line 6), where it would have been obvious to one of the ordinary skill in

the art at the time of the invention that some form of logic is necessary to detect a failure.

Beardsley discloses each processor maintaining information on the configuration of other clusters in order to reroute data (Col 4 lines 20-40) and a failover logic (Col 6 lines 50-63). However Beardsley does not specifically disclose a failover tree database containing a failover tree and at least one root node, and signaling logic sending a release message toward the root node when a degradation or failure has occurred.

Lamport discloses each node in the event of a failure, reconfiguring a network of switches/nodes, where each node updates its topology (database) according to the reconfiguration procedure. Lamport also discloses each node determining its position in the spanning tree and propagating a change to other nodes (Col 39 lines 3-28). Lamport discloses establishing a root node within the topology information (Col 39 lines 29-35).

Lamport discloses sending DEAD signals throughout the network indicating an error (Col 36 lines 50-63). Dead signals indicate a need for reconfiguration. Lamport also discloses a network member receiving a message informing it that a switch had some form of error (Col 36 lines 50-63), where it would have been obvious to one of the ordinary skill in the art at the time of the invention that sending these signal throughout the network includes sending this signal to the root node.

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the information stored within the processor as disclosed by Beardsley, to store reconfiguration information pertaining to the position of a node within a spanning tree as disclosed by Lamport. It would have also been obvious to one of the

ordinary skill in the art at the time of the invention to modify the failover logic to include indications of error, alerting nodes within the network of the need for reconfiguration.

Claim 29 Beardsley discloses in the event of a failure affecting a first processor, non volatile memory or/and cache (primary end system), routing (relinquishing) data to the second processor, non volatile memory and cache (back up end system) as disclosed in Col 2 line 59- Col3 line 6.

Claim 30 Beardsley discloses in the event of a failure affecting at least the first processor, non volatile memory or/and cache (primary end system), routing data to the second processor, non volatile memory and cache (back up end system) as disclosed in Col 2 line 59- Col3 line 6. It would have been obvious to one of the ordinary skill in the art at the time of the invention that some form of logic is required to perform routing.

Beardsley discloses each processor maintaining information on the configuration of other clusters in order to reroute data (Col 4 lines 20-40) and a failover logic (Col 6 lines 50-63). However Beardsley does not specifically disclose a failover tree database containing a failover tree and at least one root node, and a receiving logic receiving a release message.

Lamport discloses each node in the event of a failure, reconfiguring a network of switches/nodes, where each node updates its topology (database) according to the reconfiguration procedure. Lamport also discloses each node determining its position in the spanning tree and propagating a change to other nodes (Col 39 lines 3-28). Lamport discloses establishing a root node within the topology information (Col 39 lines 29-35).

Lamport discloses a node receiving DEAD signals indicating an error, where these signals indicate the need for switching and reconfiguration (Col 36 lines 50-63).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the information stored within the processor as disclosed by Beardsley, to store reconfiguration information pertaining to the position of a node within a spanning tree as disclosed by Lamport. It would have also been obvious to one of the ordinary skill in the art at the time of the invention to modify the failover logic to include indications of error, alerting nodes within the network of the need for reconfiguration.

Claim 32, 35, 41 Beardsley discloses in the event of a failure affecting at least the first processor, non volatile memory or/and cache (primary end system), routing data to the second processor, non volatile memory and cache (back up end system) as disclosed in Col 2 line 59- Col3 line 6.

Beardsley discloses the logic used to control failover and failback (Col 6 line 50- Col 7 line 40). However, Beardsley does not specifically disclose constructing a failover tree to the back up system and edge nodes . Lamport et al. ('Lamport' hereinafter) discloses in the event of a failure in a primary path, recomputing the paths between hosts on a network Col 33 line 60- Col 34 line 3). Furthermore Lamport discloses spanning tree links used in the event of reconfiguration, which occurs when there is a failure (Col 38 line 34-48).

Lamport discloses several nodes within a network (Fig 3 elements 124, 126, 140 and 142), where it would have been obvious tone of the ordinary skill in the art the time of the invention that any edge node connected to a host is equivalent to an edge node.

Therefore it would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the failover logic as disclosed by Beardsley, to include a spanning tree, ensuring that data is transmitted in a predictable and efficient fashion (Col 38 lines 34-48).

Response to Arguments

3. Applicant's arguments filed on 31 August have been fully considered but they are not persuasive.

(a) The applicant argued that the cited art does not disclose a clear motivation for combining the references as they are from two different fields of art.

The examiner acknowledges the fact that Bearsley's invention is dedicated toward hardwired paths, however the examiner maintains that the reason for combination and a motivation has already been presented in the rejection of claim 1, wherein Beardsley discloses a number of storage units connected within a cluster, performing an operation dedicated to deal with failover, where it would have been obvious to one of the ordinary skill in the art at the time of the invention that these storage devices forming a cluster make up a network, comparable to the network of switches (LAN) as disclosed in the disclosure of Lamport. Furthermore, Lamport discloses switches, where each switch is a form of a storage device, as it contains means for storage (see fig 11) .

(b) The applicant argues that the cited art does not disclose the applicant's claimed "optical communications system".

The examiner maintains that the same limitation in its broadest term is addressed within the invention of Lamport, disclosing the network units being interconnected by fiber optic cabling (Col 6 lines 47-53). Furthermore, both Beardsley and Lamport relate to high-speed data transfer/communication, where an optical system is equivalent in that optical communication involves high-speed communication within similar networks.

(c) The applicant argued that the cited art does not disclose the applicant's claimed, "constructing a failover tree...prior to a detection of a degradation of a failure affecting the primary end system".

The examiner maintains that the same limitation in its broadest term has already been disclosed within the rejection of claim 1 and 18, wherein Lamport discloses each switch comprising a knowledge of a spanning tree identifying how a plurality of switches are interconnected, where a spanning tree depicts a number of fault paths that may be chosen in order to route data to a destination. Therefore it would have been obvious to one of the ordinary skill in the art at the time of the invention that a failover tree exists before degradation in that a spanning tree exists, however, on degradation a legal path is chosen (Col 5 lines 63-Col 6 lines 21). Furthermore, Beardsley discloses a failover process where the a second path is already known for failover (Col 2 lines 59-Col 3 line 7).

(d) Arguments made pertaining to claims 27, 30 and 32 make reference to the arguments of claims 1 and 18, which have been addressed by the examiner as discussed above.

Conclusion

4. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher P. Grey whose telephone number is (571)272-3160. The examiner can normally be reached on 6:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi Pham can be reached on (571)272-3179. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christopher Grey
Examiner
Art Unit 2667

11/5/05

CHI PHAM
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

11/10/05